

**WASTE PIT AREA STORMWATER RUN-OFF
CONTROL REMOVAL ACTION WORK PLAN FEED
MATERIALS PRODUCTION CENTER
MAY 3, 1991**

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WASTE PIT AREA STORMWATER RUN-OFF CONTROL

REMOVAL ACTION

WORK PLAN

FEED MATERIALS PRODUCTION CENTER

Prepared by:

Westinghouse Materials Company of Ohio

Cincinnati, Ohio

for the

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Oak Ridge Operations Office

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TABLE OF CONTENTS

1.	INTRODUCTION	1
2.	BACKGROUND	2
2.1	Summary of Potential Threat	2
2.2	Related Actions	3
2.3	Roles of the Participants	4
2.4	Removal Action	5
2.5	Integration with the Final Remedial Action	5
3.	SUPPORT ACTIVITIES	6
3.1	Project Planning Activities	7
3.2	Training Requirements	7
4.	FIELD ACTIONS	7, 8
5.	SAMPLING AND ANALYSIS	9
6.	HEALTH AND SAFETY PLAN	9
7.	QUALITY ASSURANCE	9

DRAWINGS

- C-1 Key Plan
- C-2 Location Plan
- C-3 Site Plan

ATTACHMENTS

- I Waste Pit Area Stormwater Run-Off Control
Removal Action Schedule
- II Sampling and Analysis Plan
- III Health and Safety Plan
for the Waste Pit Area Stormwater Run-Off
Control Removal Action

1. INTRODUCTION

Operable Unit 1 includes those facilities utilized for the storage/disposal of radiological and chemical wastes from the Feed Materials Production Center (FMPC) operations. These facilities include Waste Pits 1, 2, 3, 4, 5, and 6; the Burn Pit; and the Clearwell. Analytical results indicate that elevated concentrations of uranium are present in the stormwater run-off from the waste pits and perimeter areas. Contaminated stormwater from the waste pit perimeter areas is currently released to the environment by draining to Paddy's Run. The Remedial Investigation/Feasibility Study (RI/FS) for Operable Unit 5, Environmental Media, will consider the effects of leakage from Paddy's Run into the regional aquifer. Because of the associated potential threat to human health and the environment, the Department of Energy (DOE) is pursuing a removal action to control the stormwater run-off from this area pending the outcome of the RI/FS and the implementation of a final remedial action for Operable Unit 1 and Operable Unit 5. The scope for this removal action can be broadly defined as management of radioactively contaminated stormwater run-off from the waste pit area. Waste storage units within the waste pit area that are included in this removal action include six waste pits, the Burn Pit, the Clearwell, and 4 concrete storage silos.

This removal action is a component of Operable Unit 1. All activities performed under this work plan will be in accordance with the NCP and consistent with the guidance of OSWER Directive 9360.0-03B, SUPERFUND REMOVAL PROCEDURES, Rev. 3. The Consent Agreement under Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Section 120 and 106(a) requires a work plan to be submitted for implementation of Removal Number 2, the Waste Pit Area Stormwater Run-Off Control removal action. This work plan satisfies that commitment.

An Engineering Evaluation/Cost Analysis (EE/CA), in accordance with 40 CFR 300.415, has been prepared to evaluate removal action alternatives using available data to support the selection of a preferred alternative. The National Environmental Policy Act of 1969 (NEPA) requires that federal agencies include in their decision making processes appropriate and careful consideration of all environmental effects of proposed actions. The EE/CA was prepared for the purpose of integrating the requirements of both the CERCLA and NEPA.

2. BACKGROUND

2.1 Summary of the Potential Threat

Natural drainage from the waste pit area is primarily westward toward Paddy's Run. Stormwater run-off from this area contains various concentrations of uranium.

More specifically, stormwater run-off from the majority of the soil covered surfaces of Waste Pits 1, 2, and 3 currently drains by gravity to the Clearwell. Stormwater that collects in Waste Pit 5 flows by gravity via an underground line to the Clearwell. From the Clearwell, the run-off is pumped to the Bionitrification Surge Lagoon (BSL). Stormwater that collects in Waste Pit 6 is allowed to accumulate and is periodically pumped to the BSL utilizing a portable pump and existing underground piping. Due to the evaporation rate, this is only pumped a few times per year.

The stormwater run-off from the remaining portions of the waste pit area flows to Paddy's Run. Several of these areas have been shown to produce contaminated stormwater run-off. Upon entering Paddy's Run, the potential exists for these contaminants to migrate to the Great Miami Aquifer. This aquifer is within the buried valley aquifer of the Great Miami River Basin, which has been designated as a Sole-Source Aquifer by the EPA under Section 1424(e) of the Safe Drinking Water Act. Under this designation, the Regional Administrator of Region V of the EPA has determined that this aquifer is the sole or principal source of drinking water for this area. Contamination of Paddy's Run and/or the underlying aquifer may pose potential exposure risks to public health and the environment. The areas that produce contaminated stormwater run-off are planned to be controlled by the preferred alternative which was identified in the EE/CA.

Exposure to the contaminants in the stormwater run-off can occur as a result of the release of these contaminants to Paddy's Run. The contaminants may then be discharged from Paddy's Run to the Great Miami River or the underlying sand and gravel aquifer. Paddy's Run is not used as a drinking water supply. Ingestion of sediment from the stream is considered a potential exposure pathway for children. Ingestion of groundwater from the aquifer underlying Paddy's Run is an additional potential exposure pathway. Other exposure pathways associated with the groundwater include ingestion of crops irrigated by the water, ingestion of beef from cattle exposed to uranium through water and crops, and ingestion of milk from cows exposed to uranium through water and crops.

2.2 Related Actions

Past

In 1986 a project was initiated to control the stormwater run-off from the Plant 1 storage pad area (PA 40-86602 - Surface Water Control of Plant 1 Storage Pad). Prior to the completion of this project, stormwater run-off from several portions of the Plant 1 Storage Pad flowed to Paddy's Run via drainage ditches within the Waste Pit Area. The implementation of this project redirected the stormwater flows from these portions of the Plant 1 storage pad to the site Storm Sewer System. This was accomplished by modifying a portion of the storage pad to include a curb around the periphery to keep stormwater confined to the existing pad drainage system. The drainage line from this drainage system was redirected from its previous termination point which flowed to the Waste Pit Area and directed to the Storm Sewer System. Also, northern sections of the storage pad that flowed over the grassy area to the west and then through the Waste Pit Area were redirected to the Storm Sewer System. This was accomplished by plugging the culvert that led to the Waste Pit Area and reversing the drainage ditch flow. A new storm sewer inlet was then added to accommodate these flows. This project was completed in October of 1988.

This project was related to the Waste Pit Area Stormwater Run-Off Control removal action in that it stopped the flow of contaminated stormwater run-off from the process area to the waste pit area and ultimately to Paddy's Run. The specific impact is that these actions limited the scope of this removal action to the areas surrounding the six waste pits, the Burnpit, the Clearwell, and the four concrete storage silos.

Present and Future

This removal action was originally a task in a subproject of a larger Line Item Project - "Environmental Safety and Health Improvements". This subproject entitled "Waste Water Treatment Improvements - Plant wide" includes four Tasks:

- Task 1 Waste Pit Area Stormwater Run-Off Control
- Task 2 Process Area Stormwater Run-Off Control Improvements
- Task 3 Advanced Waste Water Treatment Facility (AWWT)
- Task 4 Water Recycle and Reuse.

Task 1, Waste Pit Area Stormwater Run-Off Control, is the subject of this work plan and will be completed prior to the completion of Tasks 2 through 4. Because this ongoing project was closely related to Operable Unit 1, and would be required in some form for any final remediation activities taking place under Operable Unit 1, a decision was made to make this ongoing project a removal action. A schedule for its completion is included as Attachment I.

Tasks 2 through 4 remain ongoing projects at the FMPC, however the scopes and schedules of these line item tasks are subject to changes.

2.3 Roles of the Participants

The DOE, as the lead agency, will coordinate and execute this removal action. The U.S. EPA and the Ohio Environmental Protection Agency (OEPA) roles have been one of providing guidance and participation in the preparation of the CERCLA 120 Consent Agreement and technical information exchanges.

The U.S. EPA has reviewed and conditionally approved the EE/CA document identifying the selected removal alternative for the Waste Pit Area Stormwater Run-Off Control removal action. The U.S. EPA has approval authority for this Work Plan.

ASI, as a contractor to DOE, is conducting the RI/FS program including preparation of the South Plume removal action EE/CA and through their subcontractor, IT Corporation, providing analytical services.

WMCO, as the FMPC Operating and Maintenance contractor, is responsible to implement this removal action in a manner consistent with DOE and regulatory guidance.

A.M. Kinney, Inc., as the design consultant, is responsible for the preparation of the design plans and specifications.

2.4 Removal Action

The preferred alternative, identified in the EE/CA, incorporates planned separation of drainage areas within the waste pit area, thus isolating contaminated from noncontaminated stormwater run-off. Contaminated stormwater will continue to be collected in the existing Clearwell; and, additional contaminated stormwater will be collected in a new collection sump and pumping station that will be located south of the Clearwell. Drainage flow control devices will be installed in upstream drainage channels, located in the waste pit storage area, to restrict peak flows to the new pumping station. The new system will pump the collected stormwater run-off to the BSL, where suspended solids would be allowed to settle prior to treatment through the biodenitrification towers and effluent water treatment system.

In a proposal dated September 28, 1990, the DOE offered to construct a 150 gpm wastewater treatment system which will treat FMPC effluent prior to being discharged to the Great Miami River. In a letter dated October 25, 1990, the U.S. EPA accepted this proposal. It was agreed that this interim treatment unit will remain in operation until the advanced wastewater treatment (AWWT) system comes on-line.

2.5 Integration with the Final Remedial Action

The Waste Pit Area Stormwater Run-Off Control removal action is consistent with all final remedial action alternatives for Operable Unit 1. The final remedial action alternatives that are being considered include the following:

- Nonremoval, Physical Stabilization, Slurry Wall and Cap
- Removal, Sludge Treatment, and On-Site Disposal
- Removal, Sludge Treatment, and Off-Site Disposal

All of these final remedial action technologies will require some degree of stormwater run-off control and will benefit from the implementation of this removal action.

The Waste Pit Area Stormwater Run-Off Control removal action will be implemented far in advance of any of the alternatives for final remediation of Operable Unit 1. Therefore, no scheduling conflicts are anticipated.

3. SUPPORT ACTIVITIES

3.1 Project Planning Activities

Activities that will be undertaken prior to the actual site work are planning, training, design, and management of the removal actions preparatory efforts. These activities are required to render the area reasonably free of hazards to personnel and/or the environment until the RI/FS process has been completed and to determine if further action is required.

The following distinct engineering phases will be performed by WMC0 to provide the necessary definition for development of accurate scope, cost, and schedule documents:

a. *Project Planning*

Included in this activity will be the preparation of detailed task listings and delineation of responsibilities to support the schedule given in Attachment I. Specific items will be made available to the U.S. EPA upon completion of the engineering phases of the scope of work. These items will include information regarding the discussion of a preliminary operations and maintenance manual, cost estimate, and detailed schedule indicating project planning activities.

b. *Design of Removal Action*

Definitive design documents will be prepared for the removal action construction work.

c. *Training of Personnel*

All personnel involved will be trained in accordance with the Occupational Safety and Health Administration (OSHA) standards found in 29 CFR 1910.120.

d. *Bid and Award/Construction Management*

All bid and award documents will be prepared for the removal action construction work along with the procurement of all equipment, materials and subcontractors necessary to complete the removal action construction work.

3.2 Training Requirements

All personnel involved with the implementation of this removal action will be trained in accordance with the Occupational Safety and Health Administration (OSHA) standards found in 29 CFR 1910.120, radiation worker training, and respirator training and fit testing.

4. FIELD ACTIONS

Construction of this project will include concrete drainage ditches, dikes, culverts, and existing topographic features to collect the waste pit perimeter area stormwater run-off. A concrete collection sump will be installed south of the existing Clearwell to collect contaminated stormwater run-off and pump to the BSL. Stormwater will flow to the sump by means of installed concrete trenches, berms, and/or ditches. The stormwater run-off from other areas of the waste pit area will be rerouted away from the contaminated waste pit perimeter drainage areas and will continue to flow by gravity to Paddy's Run. Other sources of uncontrolled stormwater leaving the FMPC site will be addressed by either Operable Unit 3 - Production Area and Additional Suspect Areas, or by Operable Unit 5 - Environmental Media. Drainage Area "A" is considered to be one such area that will need to be evaluated by one or both of these Operable Units. It is anticipated that additional sources of contaminated, uncontrolled stormwater run-off will be addressed by localized soil removal and remediation. Several drawings (C-1, C-2, and C-3) have been included from the current design package to illustrate the field actions involved in this removal action. Drawing C-2 includes a construction sequence for the major construction activities included in this removal action. The design of this project, to date, was completed by A.M. Kinney, Inc. A full set of design drawings was prepared to support the line item project, but have not been included since the level of detail exceeds that required for this Work Plan. The design package will be modified to reflect the provisions of the approved EE/CA document.

Flow control equipment will be installed to regulate the flow of run-off water to the collection sump during periods of heavy rain. Much of the area directly over the waste pits is presently collected and pumped to the BSL. The basin will contain a pump pit area equipped with a sump pump to empty the pit area for maintenance.

Four submersible 700 gpm pumps will be located at the pumping station. The system has been designed so that three of the four pumps will handle a 25-year rainfall event. The fourth pump will remain in standby, but is capable of being used in an emergency, such as if an overflow is imminent. These will pump the collected stormwater from the basin to the BSL.

A 12-inch underground force main will be installed from the pump station to the BSL. At the BSL, the force main will run aboveground over the berm of the BSL. The force main is provided with a back drain valve that will open when the pumps are shut off at low level. This will allow the main to drain back to the sump to prevent freezing and eliminate the need for heat tracing the force main.

Wetlands on the FMPC site are being delineated as part of the RI/FS. Preliminary results indicate that the impacted area is small. Implementation of this removal action will result in a short-term disturbance during construction; the area disturbed will be allowed to revegetate after construction and the long-term impacts will be minimal.

The implementation of this system will consist of separate types of construction activities. These activities and a brief explanation of each are detailed below and are similarly discussed in the Health and Safety Plan (Attachment III):

Installation of drainage ditches, dikes, and culverts. This portion of the removal action will involve trenching and excavation activities that will facilitate the installation of stormsewer sections, culverts, and concrete drainage ditch sections.

Installation of inlet flow control and overflow structures. This portion of the removal action will involve excavation activities to support the installation of two concrete inlet flow control structures and one overflow stand pipe.

Installation of the new collection sump and associated equipment. This portion of the removal action will involve the most extensive excavation. The excavation will be large enough to facilitate the construction of the collection sump. The approximate dimensions of the excavation for this collection sump are 60' wide x 110' long x 15' deep. This portion of the removal action will also include the installation of the pumps, piping, and instrumentation for the operation of this system. Installation of the collection sump will include relocation of a portion of the perimeter roadway. Also, installation of the trailer-mounted pilot scale treatment unit will be included in this portion. This unit shall conform to all FMPC standards, including IHS-F-06.

Installation of the underground force main. This portion of the removal action involves the installation of the underground force main piping from the collection sump and pump station to the BSL.

It should be noted that the current project design may require modification. Modification of the design may be required to ensure that a maximum permeability of 1×10^{-7} cm/sec is achieved in the two detention areas. If existing conditions do not achieve this permeability, modifications to the soils in the detention areas will be required.

Operations and Maintenance

After construction is complete and after WMC0 completes the start-up testing period, the system will be operated and maintained by WMC0 Operations. WMC0 Operations will be responsible for the operation, monitoring and maintenance of the system. Existing WMC0 utilities operators will control this system. The Utility Engineers will be assigned as the supervisory responsible for this system and will be available on site at all times. Site Standard Operating Procedures (SOPs) will be developed and will cover the operation and maintenance of the system.

5. SAMPLING AND ANALYSIS PLAN

The stormwater run-off from portions of the Waste Pit Area has been determined to have elevated concentrations of uranium, warranting this removal action. In addition, sampling and analysis of the soils in areas that will be involved in construction activities has been performed.

Additional sampling and analysis, including the verification of a maximum permeability of 1×10^{-7} cm/sec in the detention areas, will be performed to support the implementation of this removal action. Proposals will be requested of experienced geologic consultants for the purpose of verifying this permeability. The selected consultant will perform both field and laboratory tests for verification of the permeability factor. A copy of the specific sampling and analysis plan for the implementation of this removal action is presented as Attachment II.

6. HEALTH AND SAFETY PLAN

The work to be performed will be consistent with the Health and Safety Plan prepared for this removal action. It is provided as Attachment III of this work plan. The plan identifies, evaluates, and controls all identified safety and health hazards. In addition, it provides for emergency response for hazardous operations. The plan is consistent with 29 CFR 1910.120 and the FMPC Site Health and Safety Plan. Safety documentation will be prepared according to FMPC-2116 Topical Manual "Implementing FMPC Policies and Procedures for System Safety Analysis." FMPC-2116 has been prepared to implement DOE Order 5481.1B "Safety Analysis and Review System" and DOE/OR-901 "Guidance for Preparation of Safety Analysis Reports".

7. QUALITY ASSURANCE

The overall quality assurance program at the FMPC is described in the site Quality Assurance Plan, FMPC 2139. The Quality Assurance Plan is based on the criteria specified in ASME NQA-1, Federal EPA Guideline QAMS-005/80 and DOE Orders 5700.6 and 5400.1. Specific quality assurance requirements will be incorporated into written and approved procedures and into personnel training. The WMCO Quality Department will conduct surveillance and inspections and/or audits to verify compliance throughout the execution of this removal action.

1403

DRAWINGS

1. C-1 Key Plan
2. C-2 Location Plan
3. C-3 Site Plan

12

10